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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,098	08/22/2003	Harry L. Tuller	MIT.9908	8403
51414	7590	06/02/2005	EXAMINER	
GOODWIN PROCTER LLP PATENT ADMINISTRATOR EXCHANGE PLACE BOSTON, MA 02109-2881			CONNELLY CUSHWA, MICHELLE R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/646,098

**Applicant(s)**

TULLER ET AL.

**Examiner**

Michelle R. Connelly-Cushwa

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 3-5 and 11-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-10 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-16 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0204.0803</u> . | 6) <input type="checkbox"/> Other: ____.  |

***Election/Restrictions***

Applicant's election without traverse of:

A-1. Stabilized barium titanate comprising  $\text{Zr}(\text{BaZrO}_3)$ ;

B-1. Optical structure with a buffer layer; and

C-1. Buffer layer comprising  $\text{MgO}$ ,

which includes claims 1, 2, 6-10 and 14-16 in the reply filed on April 18, 2005 is acknowledged.

***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statements filed on February 2, 2004 and August 22, 2003 have all been considered and made of record (note the attached copies of form PTO-1449).

***Drawings***

Ten (10) sheets of formal drawings were filed on August 22, 2003 and have been accepted by the Examiner.

***Specification***

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 6, 9 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Swartz et al. (US 5,198,269).**

Regarding claims 1 and 9; Swartz et al. discloses an optical structure (see column 1, lines 25-27) and a method of forming the optical structure, comprising:

- a substrate having a surface; and
- a modified barium titanate  $[(\text{Sr},\text{Ba})\text{TiO}_3 \text{ or } (\text{Ba}(\text{Ti},\text{Zr})\text{O}_3)]$  deposited on the surface of the substrate (see the abstract).

Regarding claims 6 and 15; the substrate comprises Si or SOI with an optical buffer layer (the first layer of a sol-gel perovskite; see the abstract).

**Claims 1, 6-9 and 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by McKee et al. (US 6,103,008).**

Regarding claims 1 and 9; Swartz et al. discloses an optical structure and a method of forming the optical structure, comprising:

- a substrate (22 in Figure 2; 72 in Figure 5) having a surface; and
- a modified barium titanate (24 in Figure 2; 74 in Figure 5; see column 2, line 59, through column 3, line 12) deposited on the surface of the substrate.

Regarding claims 6, 7, 15 and 16; the substrate (22, 72) comprises Si or SOI (see column 2, lines 34-35) with an optical buffer layer (23 in Figure 2; 73 in Figure 5; MgO).

Regarding claims 8 and 14; the structure further comprises electrodes (78, 80 in Figure 5) on a surface of the stabilized barium titanate configured to form an electro-optic structure (see column 6, lines 26-43).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKee et al. (US 6,103,008) in view of Rehrig et al. ("Piezoelectric properties of zirconium-doped barium titanate single crystals grown by templated grain growth").**

Regarding claims 2 and 10; McKee et al. discloses all of the limitations of claims 2 and 10 as applied above, except for specifically stating that the  $\text{Zr}(\text{BaZrO}_3)$  includes 2 to 20 mol%. Rehrig et al. discloses that  $\text{Zr}(\text{BaZrO}_3)$  within the range of 2-20 mol% may be used to stabilize a barium titanate film. Since, McKee et al. suggests that the barium titanate film is modified with Zr, one of ordinary skill in the art would have found it obvious to incorporate 2-20 mol% of  $\text{Zr}(\text{BaZrO}_3)$  in the modified barium titanate film disclosed by McKee et al. to stabilize the film.

**Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swartz et al. (US 5,198,269) in view of Rehrig et al. ("Piezoelectric properties**

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**of zirconium-doped barium titanate single crystals grown by templated grain growth”).**

Regarding claims 2 and 10; Swartz et al. discloses all of the limitations of claims 2 and 10 as applied above, except for specifically stating that the  $\text{Zr}(\text{BaZrO}_3)$  includes 2 to 20 mol%. Rehrig et al. discloses that  $\text{Zr}(\text{BaZrO}_3)$  within the range of 2-20 mol% may be used to stabilize a barium titanate film. Since, Swartz et al. suggests that the barium titanate film is modified with  $\text{Zr}(\text{BaZrO}_3)$ , one of ordinary skill in the art would have found it obvious to incorporate 2-20 mol% of  $\text{Zr}(\text{BaZrO}_3)$  in the modified barium titanate film disclosed by Swartz et al. to stabilize the film.

### ***Conclusion***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

  
Michelle R. Connelly-Cushwa  
Patent Examiner  
May 26, 2005